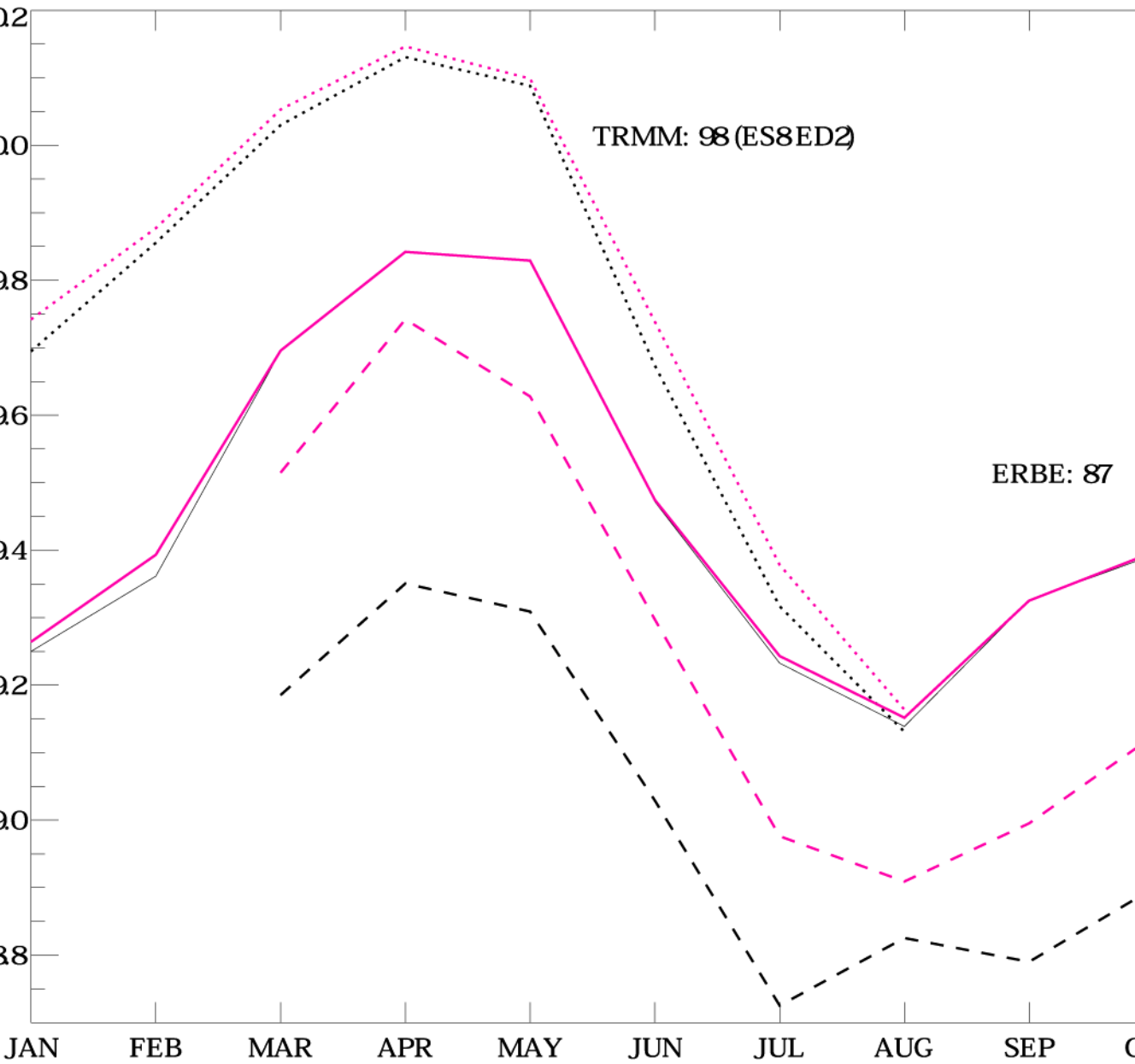


Atmospheric Greenhouse Effect from ERBE, TRMM & TERRA: Relationship with Layered Precipitable Water

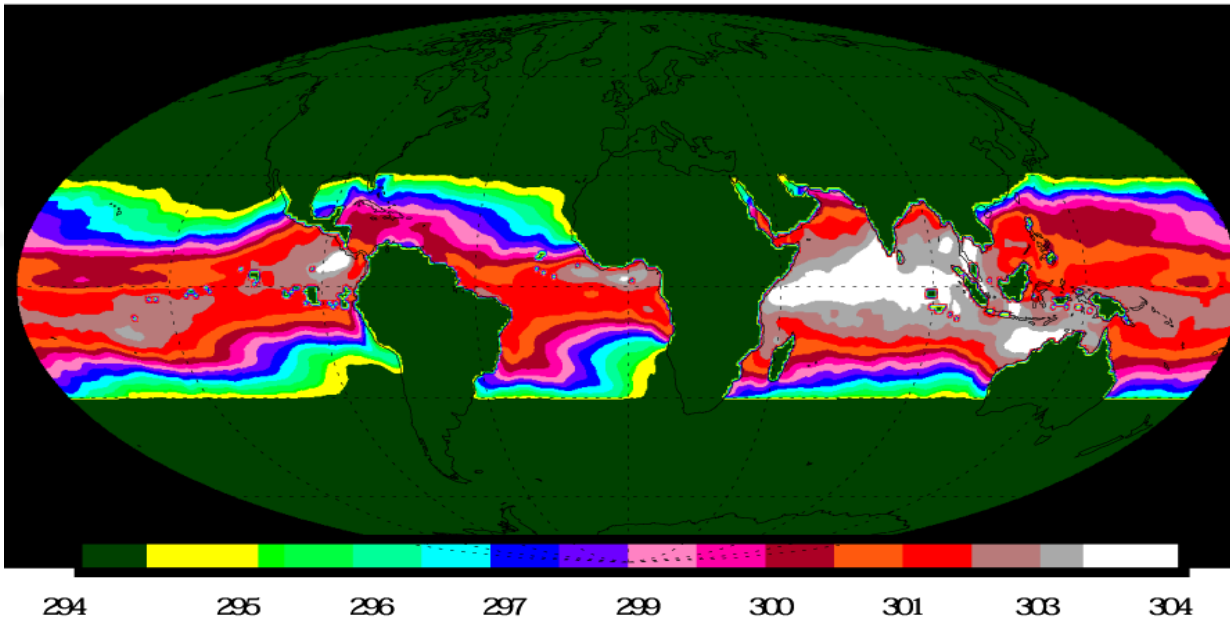
Anand Inamdar & V. Ramanathan

**4th CERES Science Team Meeting, Newport News, Hampton
Virginia, May 1 – 3, 2001**

SURFACE TEMPERATURE : TROPICAL OCEANS

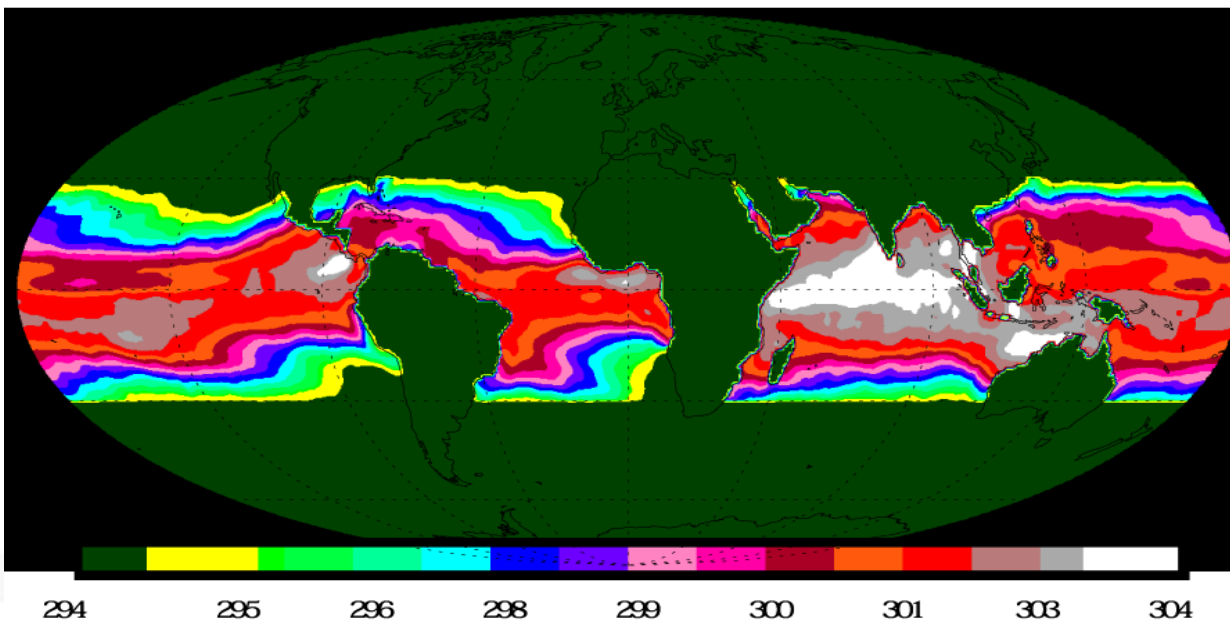


MONTHLY MEAN CLEAR-SKY SST APR 1998



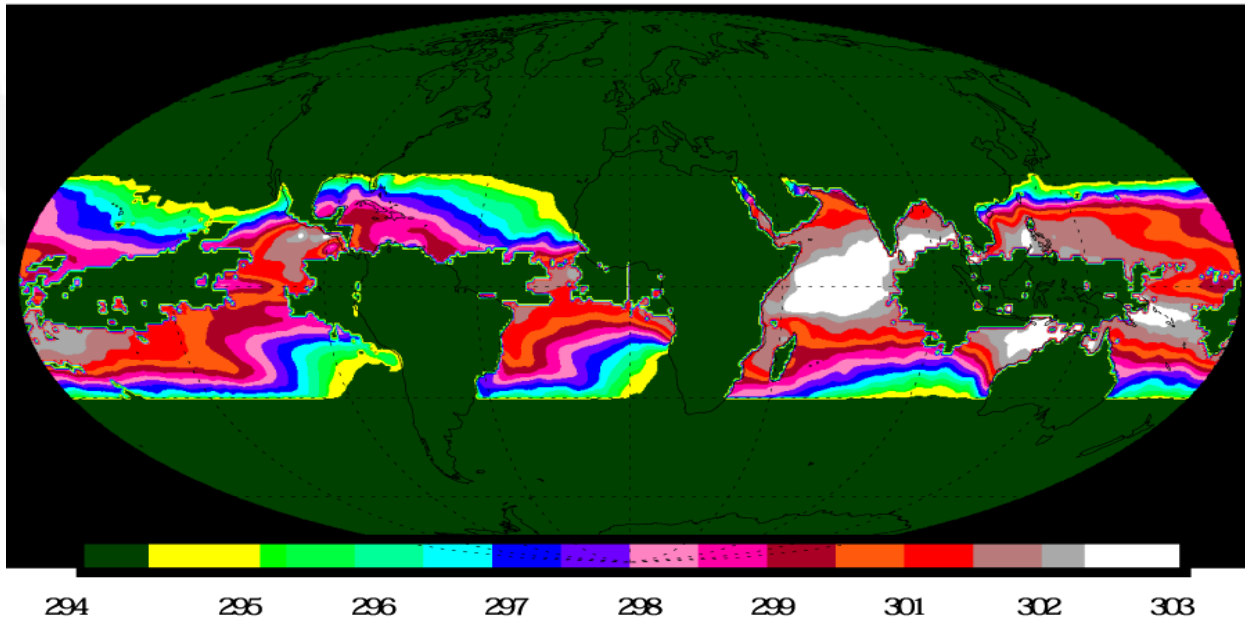
Mean
300.13

MONTHLY MEAN ALL-SKY SST APR 1998



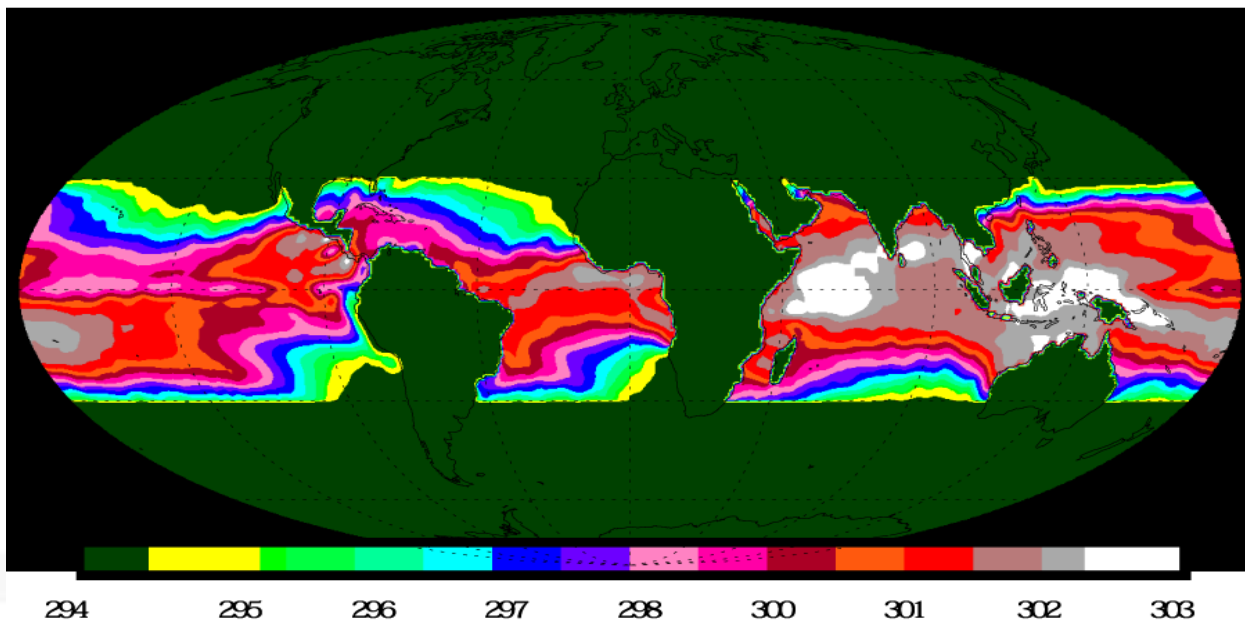
Mean
300.15

MONTHLY MEAN CLEAR-SKY SST APR 2000



Mean
299.35 K

MONTHLY MEAN ALL-SKY SST APR 2000



Mean
299.75 K

QUESTIONS:

Is there increased cloudiness over the warmer waters during 2000?

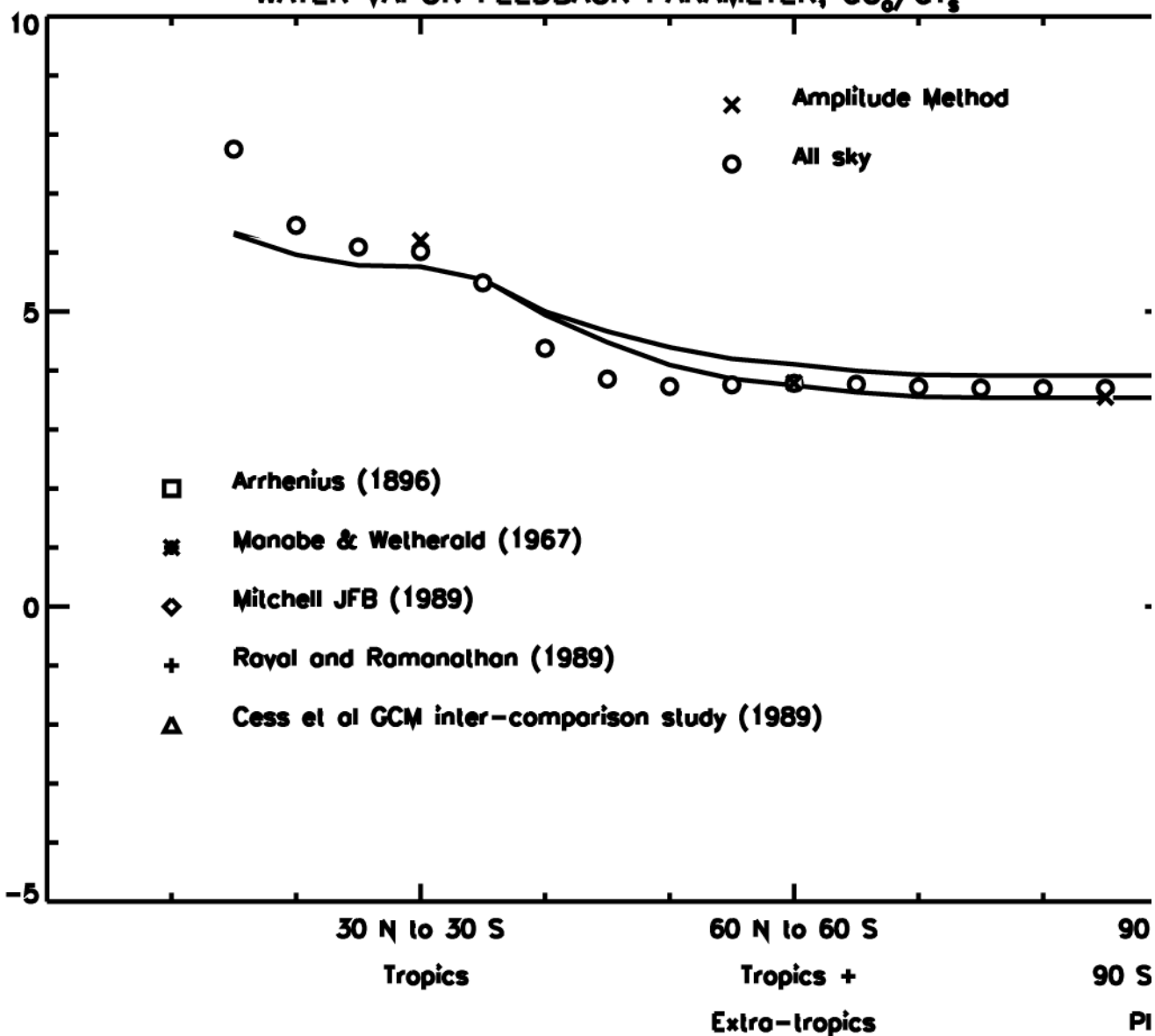
Or

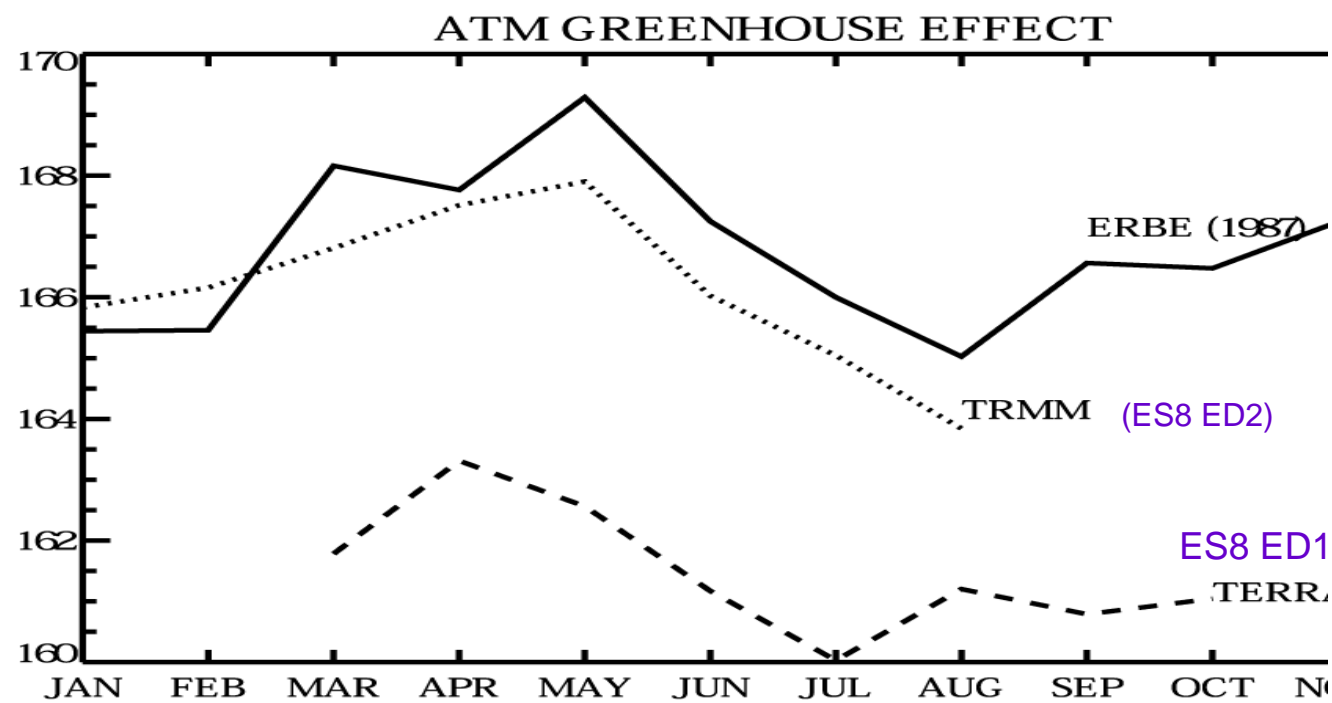
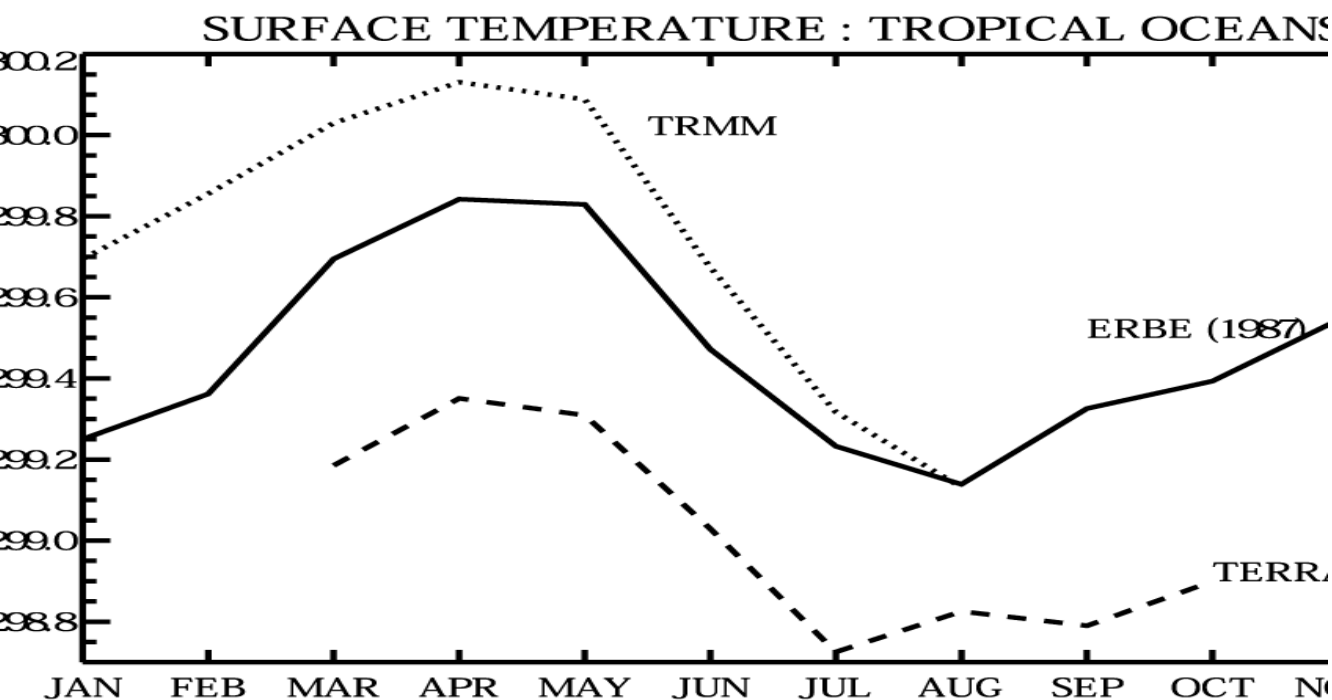
Is it an artifact of the ERBE Scene id algorithm?

Or

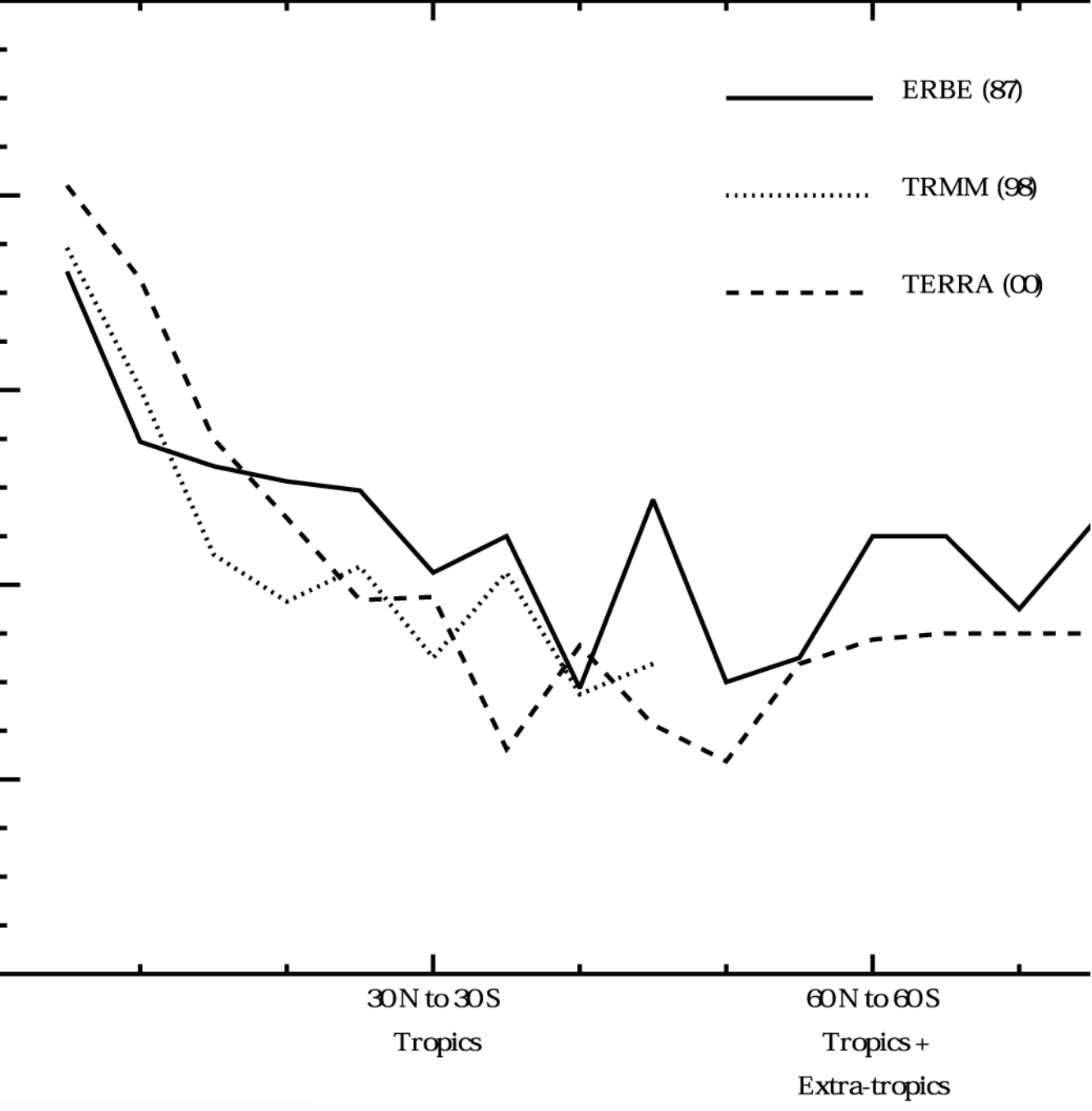
Is it a problem specific to the TERRA ?

WATER VAPOR FEEDBACK PARAMETER, dG_o/dT_s

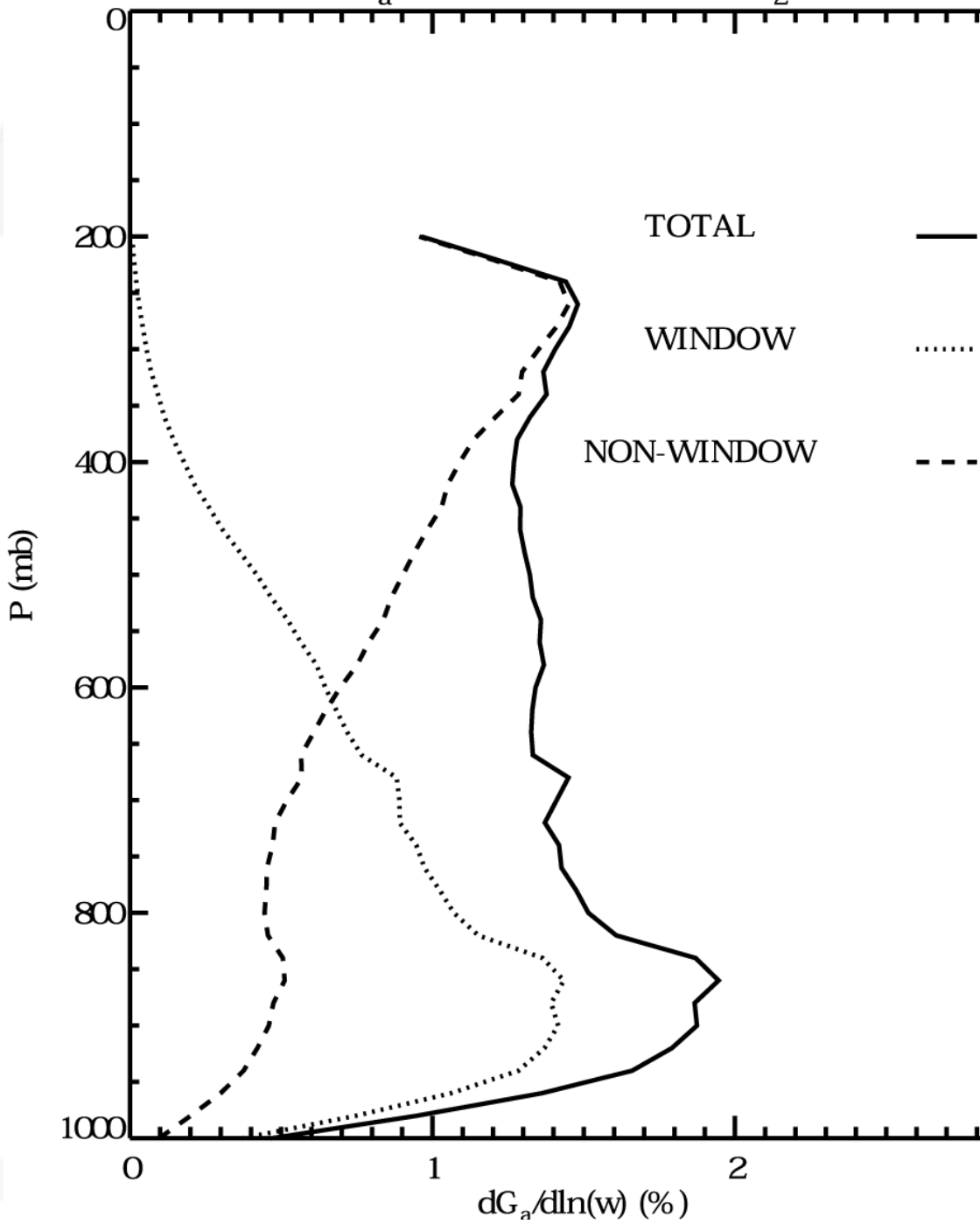




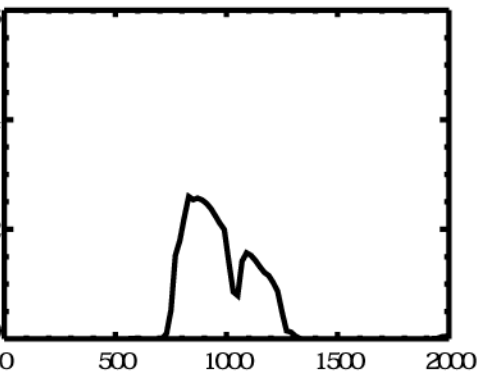
WATER VAPOR FEEDBACK PARAMETER, dG_a/dT_s



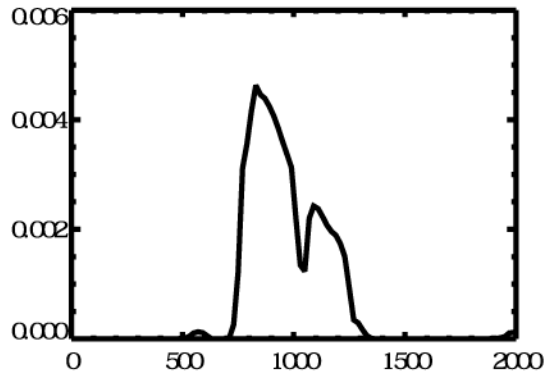
TROPICAL ATM: G_a -SENSITIVITY TO H_2O PERTUR



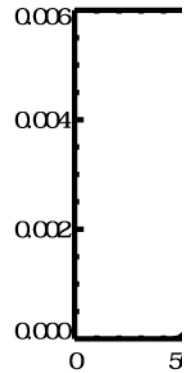
H PERTURBED BET SFC & 910mb



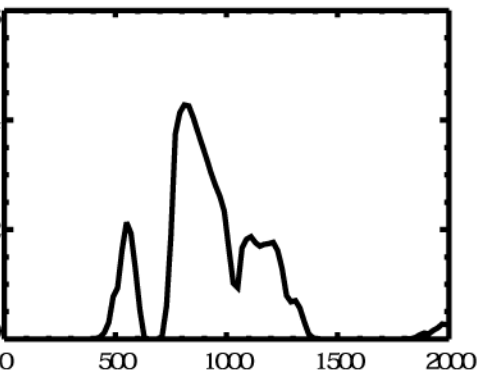
RH PERTURBED BET 910 & 810mb



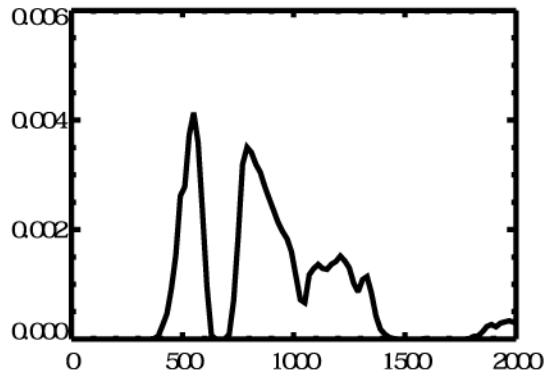
RH PERT



H PERTURBED BET 710 & 610mb



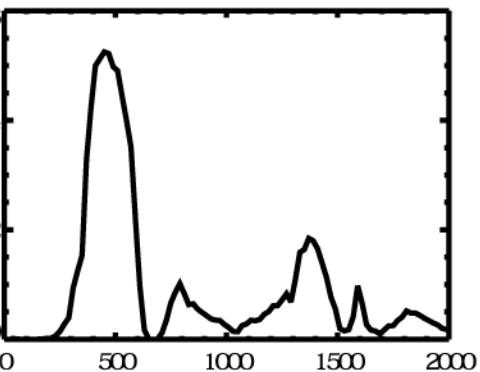
RH PERTURBED BET 610 & 510mb



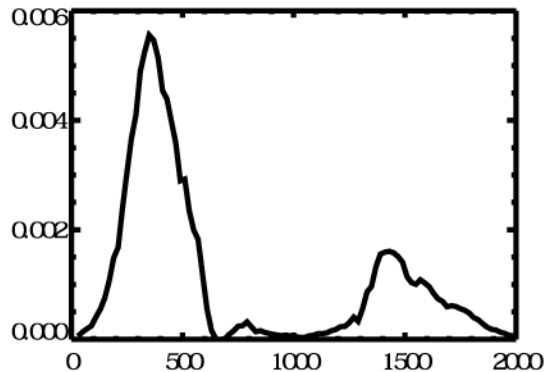
RH PERT



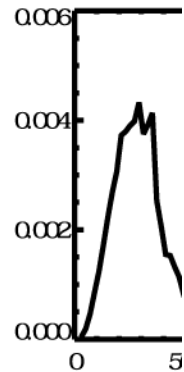
H PERTURBED BET 410 & 310mb



RH PERTURBED BET 310 & 210mb



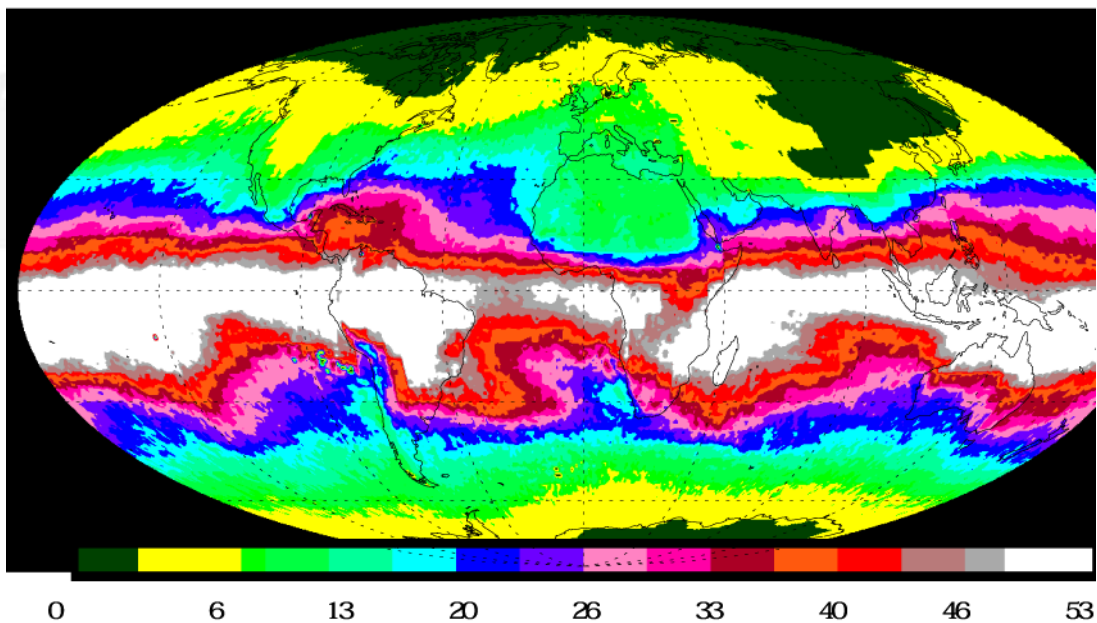
RH PERT



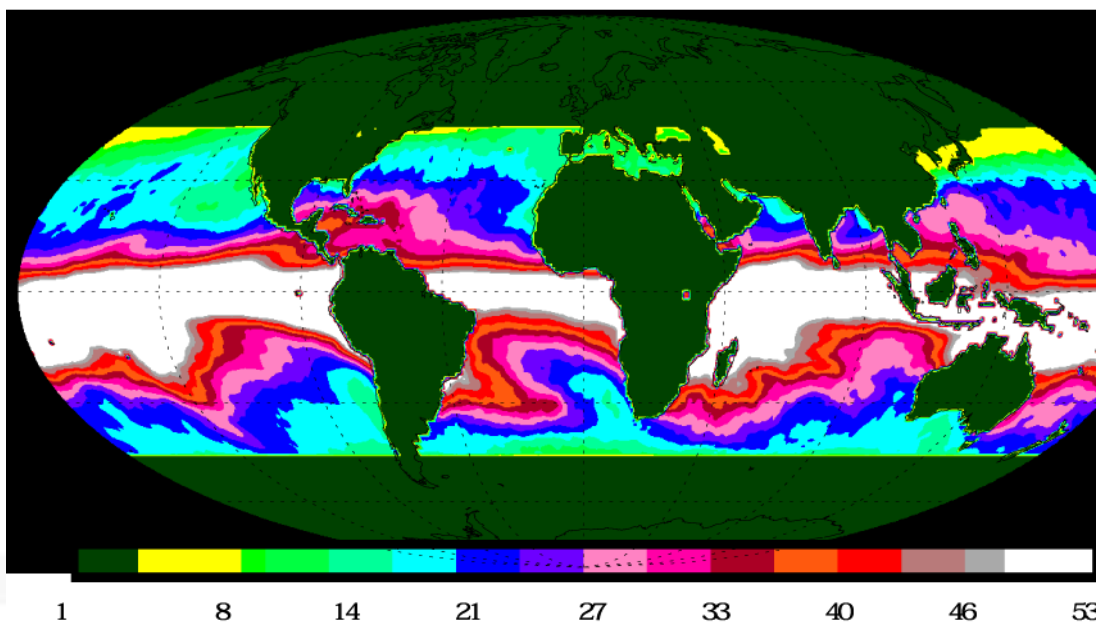
Water Vapor Data Sources

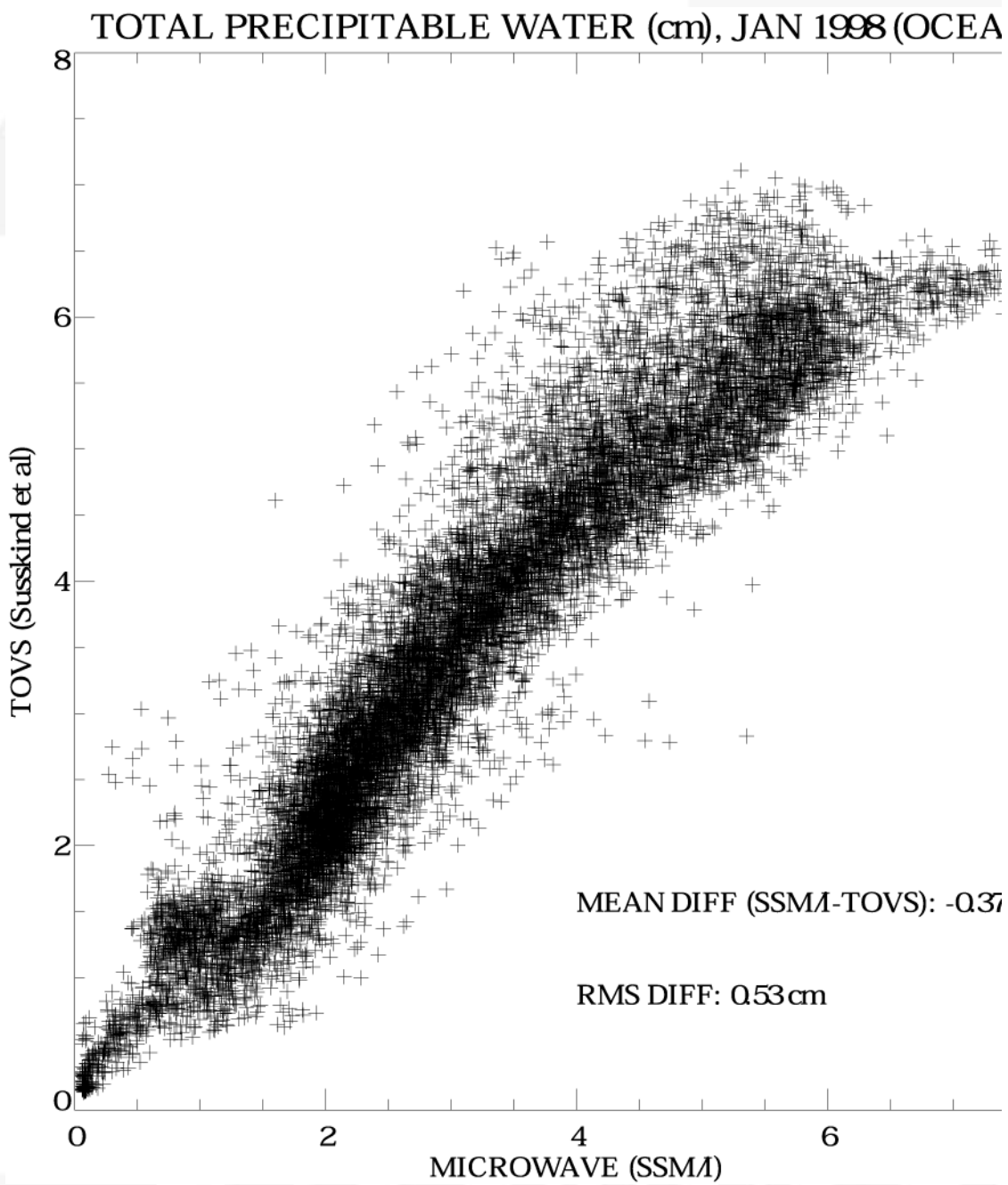
- . Radiosondes
- . SSM/I
- . SSMT2 on board the DMSP (Dr. B. J. Sohn)
- . TOVS Pathfinder Path A Project (Susskind et al)

MONTHLY MEAN H₂O FROM NOAA 14 (AM & PM) FOR JAN 1998

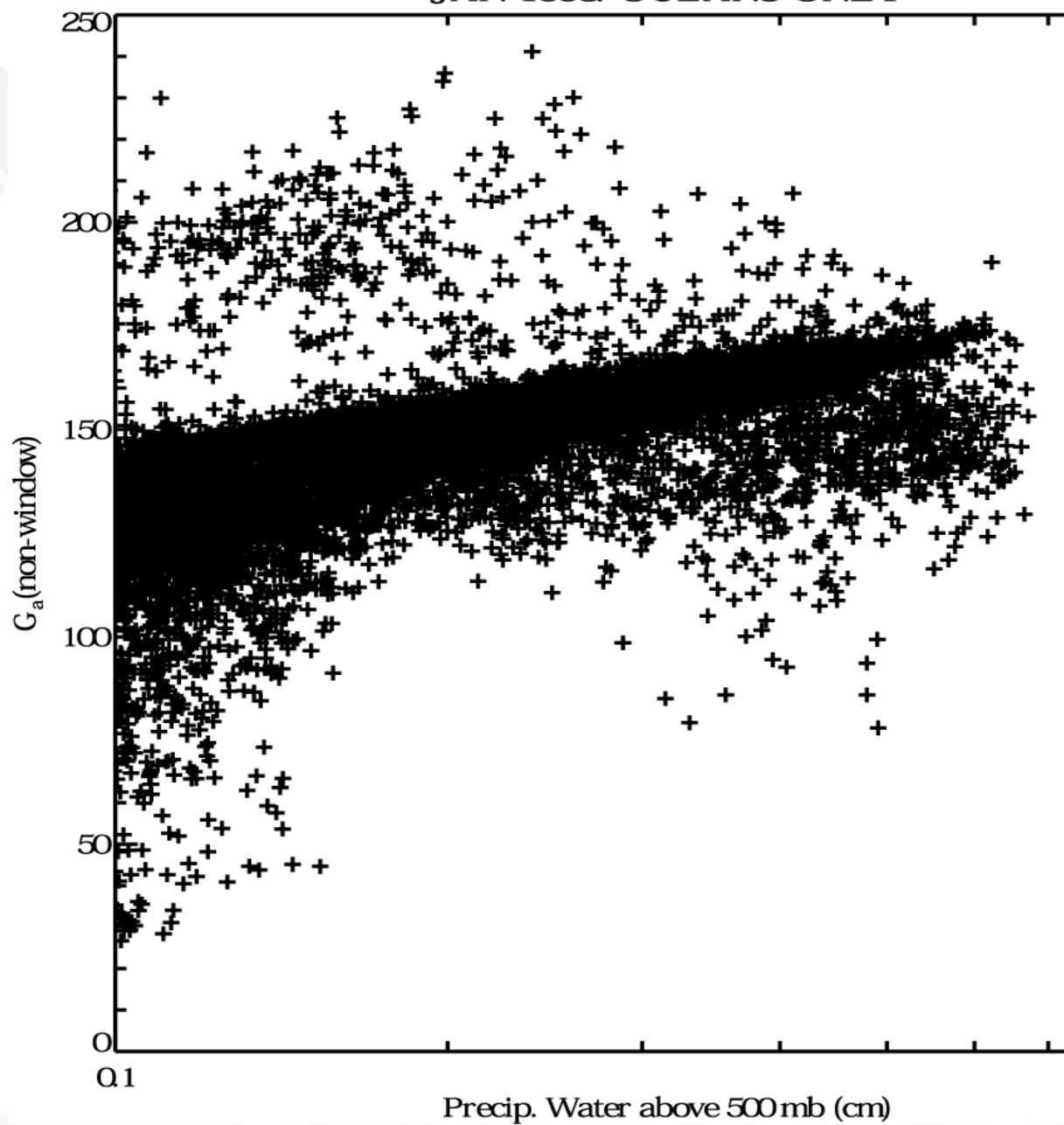


MONTHLY MEAN H₂O FROM MICROWAVE FOR JAN 98





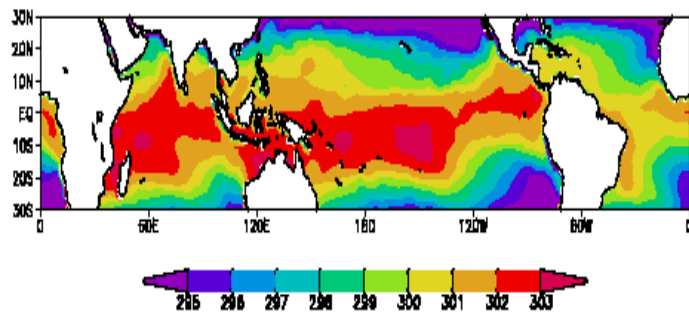
JAN 1998 OCEANS ONLY



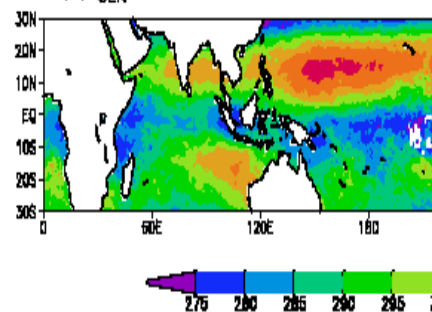
Jan 1998

Jan 1999

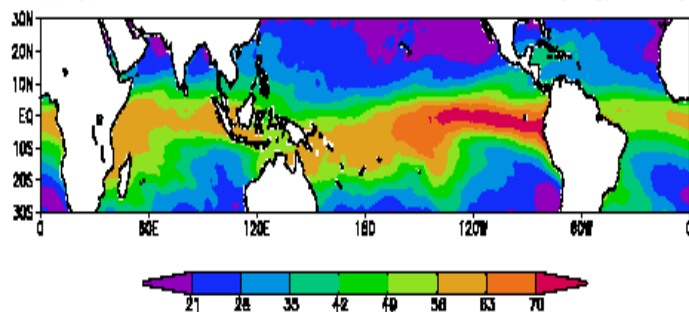
SST (K)



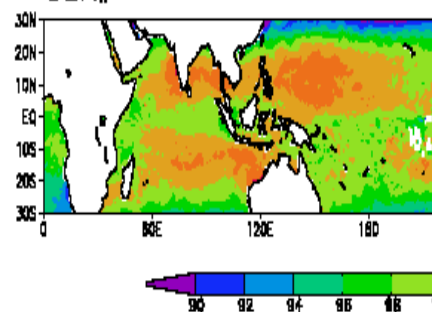
OLR_{CLR}



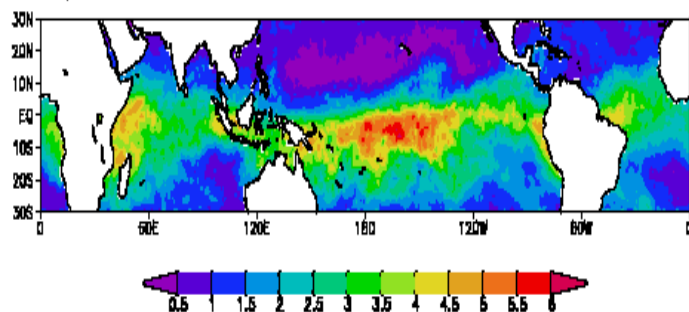
TPW (kg/m²)



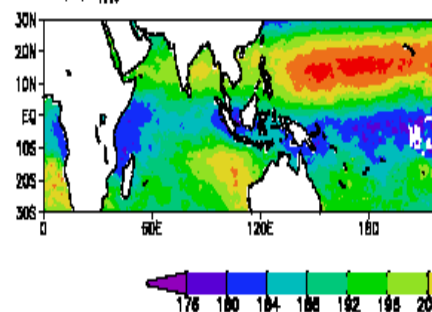
OLR_w



UTW (kg/m²)

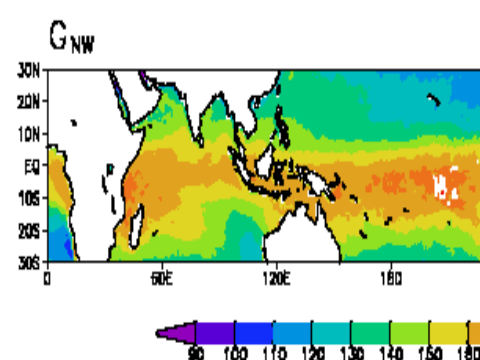
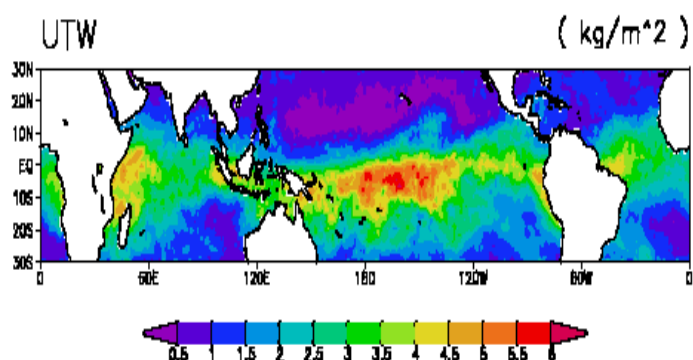
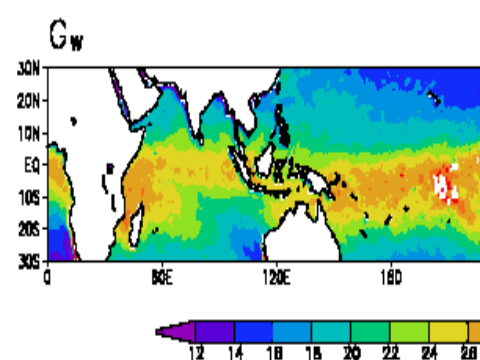
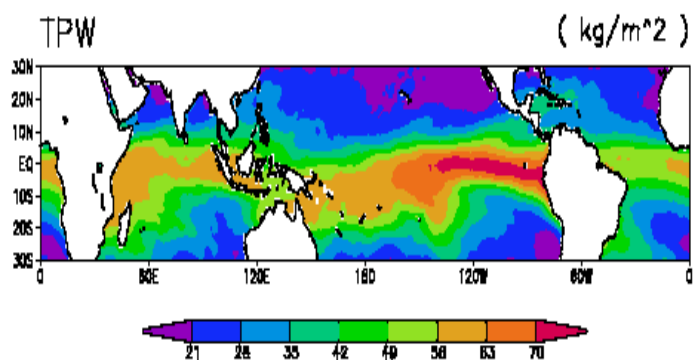
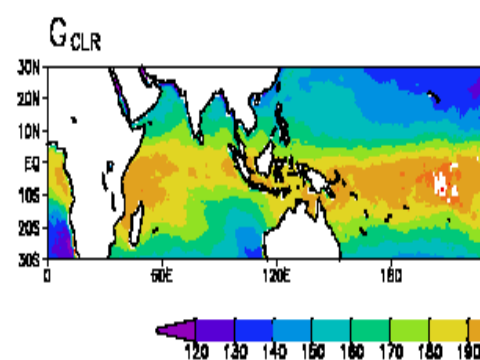
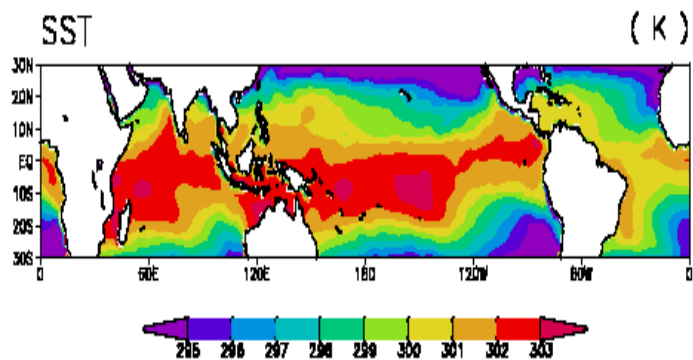


OLR_{NW}



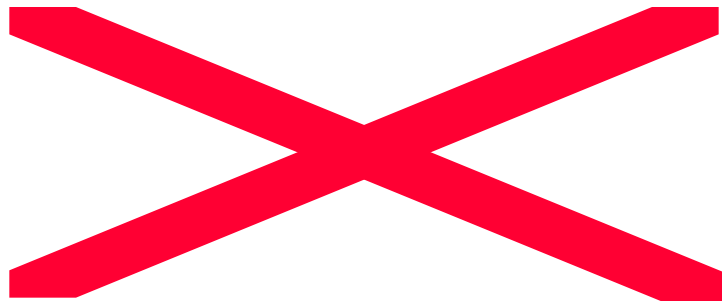
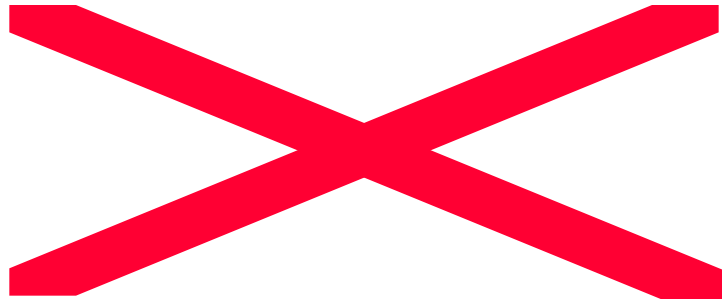
Jan 1998

Jan 1998



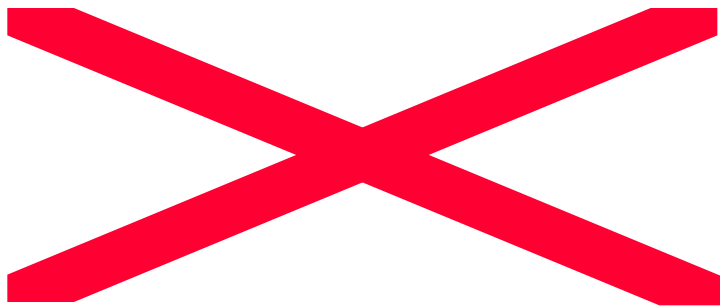
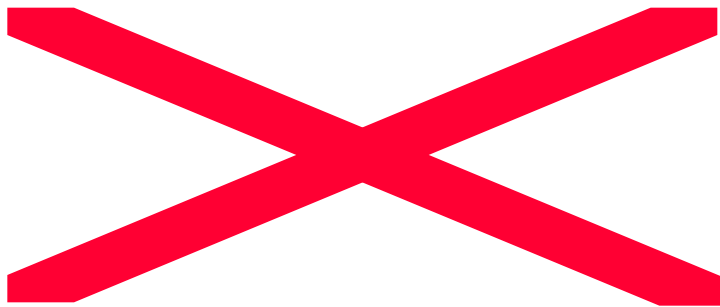
Greenhouse Effect (Jan 1998)

(total, window, non-window)

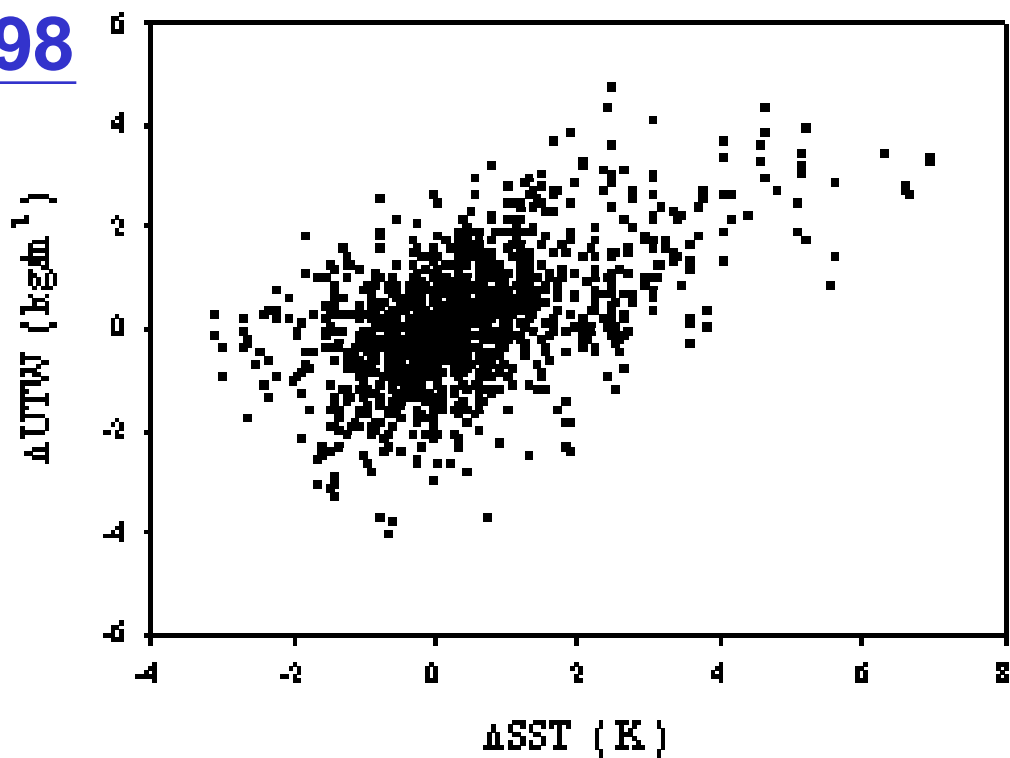


LABORAT

Greenhouse Index (Jan 1998)



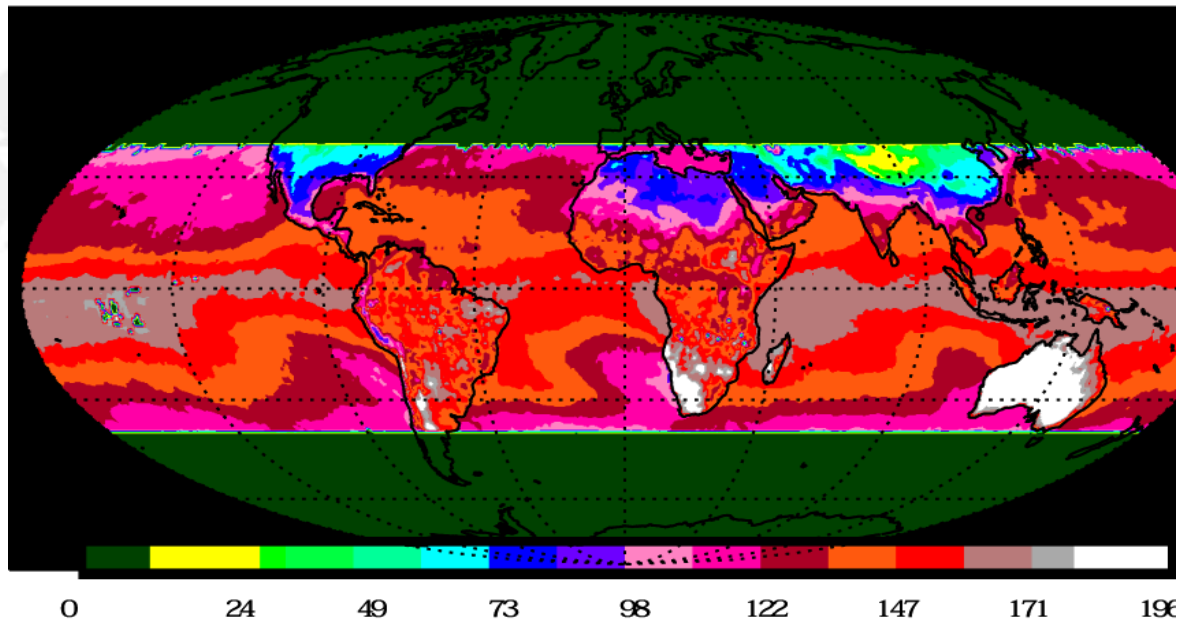
SST Changes vs. UTW Changes (Jan 1999 – Jan 1998)



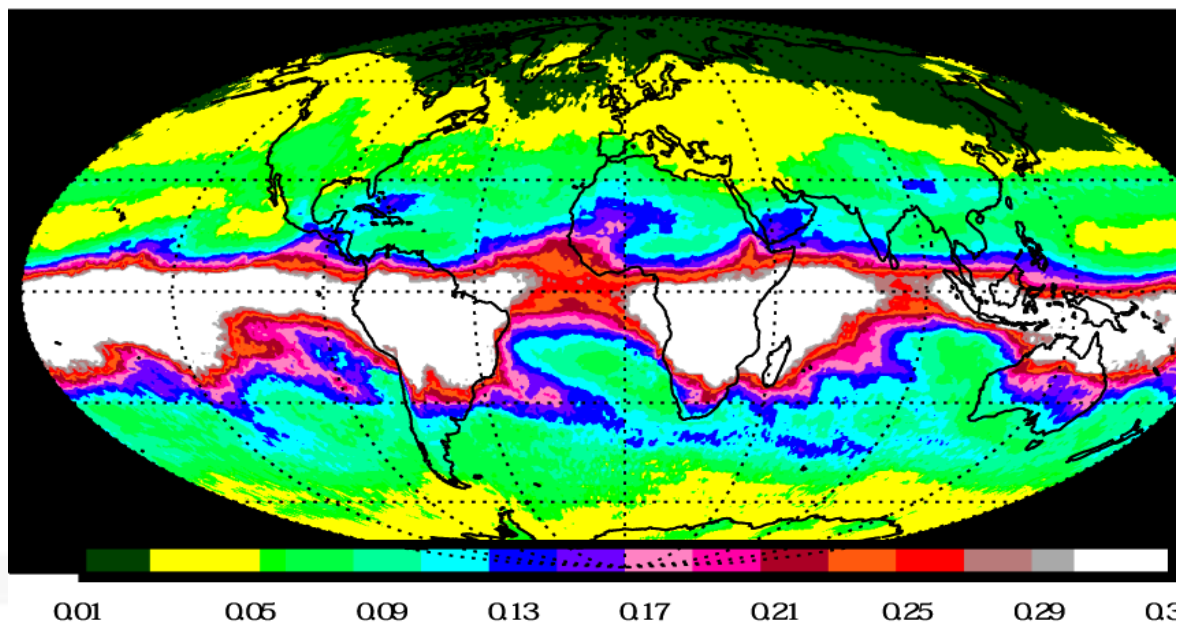
UTW: Integrated water vapor between 200 hPa and 500 hPa

Courtesy: B. J. SOHN

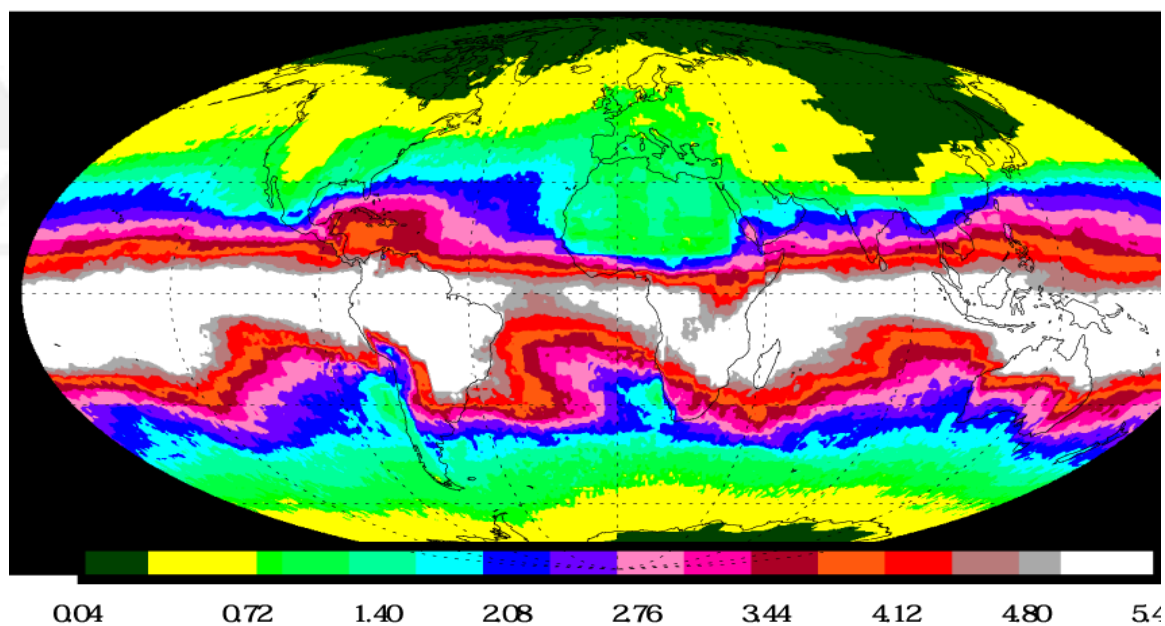
ATM GREENHOUSE EFFECT (NON-WINDOW) JAN 1998



UTH (ABOVE 500hpa)



TOTAL COLUMN PRECIP WATER (cm) JAN 1998



UTH (ABOVE 500hpa)

